

Appendix K. Fate and Ecological Effects Bibliography

Degradation Studies

- MRID 161- 1 Hydrolysis
- 00096974 Wolfe, N.L.; Zepp, R.G.; Doster, J.C.; et al. (1976) Captan hydrolysis. *Journal of Agricultural and Food Chemistry* 24(5):1041- 1045. (Also~In~unpublished submission received May 30, 1978 under 239-2211; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:234046-R)
- 40208101 Pack, D. (1987) [Trichloromethyl-[Carbon-14]] Captan Hydrolysis Products: Laboratory Project ID: MEF-0002, 8702383. Unpublished study prepared by Chevron Chemical Co. 28 p.
- 41176301 Lee, K. (1989) Trichloromethyl-¹⁴C|Captan--Hydrolysis at 25(°)C: Project ID: Report No. WRC 89-44; Study No. ENV-011. Unpublished study prepared by ICI Americas Inc. 37 p.
- 161-2 Photodegradation in Water
- 40208102 Pack, D. (1986) Photolysis of Captan in Sterile Aqueous Solution: Laboratory Project ID: MEF-0001. Unpublished study prepared by Chevron Chemical Co. 13 p.
- 41176301 Lee, K. (1989) ¹⁴C|Trichloromethyl-¹⁴C|Captan--Hydrolysis at 25(°)C: Project ID: Report No. WRC 89-44; Study No. ENV-011. Unpublished study prepared by ICI Americas Inc. 37 p.
- 161-2 Photodegradation in Soil
- 4065809 Ruzo, L. (1988) Soil Surface Photolysis of ¹⁴C-Trichloro- methyl| Captan in Natural Sunlight: Laboratory Project ID: 231. Unpublished study prepared by Pharmacology and Toxicology Research Laboratory. 117 p.
- 4065810 Ruzo, L. (1988) Soil Surface Photolysis of ¹⁴C| Captan in Natural Sunlight: Laboratory Project ID: 232. Unpublished study prepared by Pharmacology and Toxicology Research Laboratory. 109 p.

Metabolism Studies

- 162-1 Aerobic Soil Metabolism

40658007 Pack, D.; Verrips, I. (1988) Aerobic Soil Metabolism of Trichloro-methyl-Carbon 14||Captan: Laboratory Project ID: MEF-0060/ 8809887. Unpublished study prepared by Chevron Chemical Co. 49 p.

43868902 Freeman, B.L. (1993) Tetrahydrophthalimide: Laboratory Soil Degradation Study. Performed by ICI Agrochemiclas. Submitted by ICI Americas, Inc. Wilmington, DE 24p.

162-2 Anaerobic Soil Metabolism

0009881 Pack, D.E. (1979) The Anaerobic Soil Metabolism of Carbonyl- ¹⁴C|captan: File No. 721.14. (Unpublished study received Aug 27, 1979 under 239-2457; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:240891-B).

162-3 Anaerobic Aquatic Metabolism

43868905 Travis, J.S. (1983) Captan: Degradation in Sediment Water Systems under Laboratory Conditions

Mobility

163-1 Leaching, Adsorption/Desorption

40658011 Pack, D. (1987) Estimation of Soil Adsorption Coefficient of Captan from TLC Data: Laboratory Project ID: MEF-0073/8726836. Unpublished study prepared by Chevron Chemical Co. 39 p.

00160301 Kenaga, E. (1980) Predicted bioconcentration factors and soil sorption coefficients of pesticides and other chemicals. *Ecotoxicology and Environ. Safety* 4:26-38.

Dissipation

164-1 Terrestrial Field Dissipation

40823901 Jones, P. (1988) Captan 50-WP Field Dissipation Study on California Strawberries: Project ID PAL-EF-87-17F. Unpublished study prepared by Morse Laboratories, Inc. in association with Pan-Agricultural Laboratories, Inc. 199 p.

40893601 Jones, P. (1988) Captan 50-WP Field Dissipation Study on Oregon Grapes: Project ID: PAL-EF-87-17D. Unpublished study prepared by Morse Laboratories, Inc. 216 p.

40893602 Jones, P. (1988) Captan 50-WP Field Dissipation Study on Florida Tomatoes: Project ID: PAL-EF-87-17C. Unpublished study prepared by Morse Laboratories, Inc. 184 p.

- 40893603 Jones, P. (1988) Captan 50-WP Field Dissipation Study on California Tomatoes: Project ID: PAL-EF-87-17E. Unpublished study prepared by Morse Laboratories, Inc. 170 p.
- 40932201 Jones, P. (1988) Captan 50-WP Field Dissipation Study on New York Apples: Proj. I.D. PAL-EF-87-17A. Unpublished study prepared by Morse Laboratories, Inc. 209 p.
- 40932202 Jones, P. (1988) Captan 50-WP Field Dissipation Study on Texas Cantaloupes: Proj. I.D. PAL-EF-87-17B. Unpublished study prepared by Morse Laboratories, Inc. 185 p.

Accumulation

165- 1 Pesticide Accumulation in Fish

- 40756601 Surprenant, D. (1988) Bioconcentration and Elimination of ¹⁴C-residues by Bluegill (*Lepomis macrochirus*) exposed to Cyclohexane Carbon 14-Captan: T-13068: Final Report: SLS Report #87-11-2558: Study #723.0387.6109.140/240. Unpublished study prepared by Springborn Life Sciences, Inc. 67 p.
- 40756602 Surprenant, D. (1988) Bioconcentration and Elimination of ¹⁴C-residues by Bluegill (*Lepomis macrochirus*) exposed to Trichloromethyl Carbon 14-Captan: T-13069: Final Report: SLS Report #87-12-2574: Study #723.0387.6108.140/240. Unpublished study prepared by Springborn Life Sciences, Inc. 70 p.
- 40225601 US EPA (1975) Substitute Chemical Program. Initial Scientific and Mini-Economic Review of Captan: [Fish Bioaccumulation]: Laboratory Project ID. EPA-540/1-75-012. Unpublished study. 38 p.
- 00160301 Kenaga, E. (1980) Predicted bioconcentration factors and soil sorption coefficients of pesticides and other chemicals. *Ecotoxicology and Environ. Safety* 4:26-38.

Ecological Bibliography

MRID Study Title

Amphibians

Ecotox 90515 Mouchet, F., Gauthier, L., Mailhes, C., Ferrier, V, and Devaux, A. 2006. Comparative evaluation of genotoxicity of captan in amphibian larvae (*Xenopus laevis* and *Pleurodeles waltl*) using the comet assay and the micronucleus test. *Environmental Toxicology* 21(3): 264-277.

Fish

40098001 Mayer, F.; Ellersieck, M. (1986) *Manual of Acute Toxicity: Interpretation and Data Base for 410 Chemicals and 66 Species of Freshwater Animals*. U.S. Fish and Wildlife Service; Resource Publication 160: 579 p.

00057846 Hermanutz, R.O.; Mueller, L.H.; Kempfert, K.D. (1973) Captan toxicity to fathead minnows (*Pimephales promelas*), bluegills (*Lepomis macrochirus*), and brook trout (*Salvelinus fontinalis*). *Journal of the Fisheries Research Board of Canada* 30(12):1811-1817. (Also in unpublished submission received Jan 21, 1977 under 239-533; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:230401-C)

GS0120-42 U.S. EPA (1979) 96-hr LC50 study of technical captan to bluegill. Laboratory of Terrestrial and Aquatic Biology, Chemical and Biological Investigations Branch, Beltsville, MD.

43869806 Kent, S.; Sankey, S.; Caunter, J.; et al. (1994) THPI: Acute Toxicity to Rainbow Trout (*Oncorhynchus mykiss*): Lab Project Number: BL5237/B: AA0427/B. Unpublished study prepared by Zeneca Ltd., Brixham Environmental Lab. 19 p.

44738801 Kelso, H.; Kent, S.; Morris, D. et al. (1995) THP Am: Acute Toxicity to Rainbow Trout (*Oncorhynchus mykiss*): Lab Project Number: AB0085/C: BL5445/B. Unpublished study prepared by Zeneca Limited. 19 p.

Freshwater Invertebrates

GS0120-41 U.S. EPA (1979) 48-hr EC50 study of technical captan to *Daphnia magna*. Laboratory of Terrestrial and Aquatic Biology, Chemical and Biological Investigations Branch, Beltsville, MD.

43869808 Kent, S.; Sankey, S.; Banner, A.; et al. (1994) THPI: Acute Toxicity to *Daphnia magna*: Lab Project Number: BL5239/B: AA0427/D. Unpublished study prepared by Zeneca Ltd., Brixham Environmental Lab. 18 p.

44148801 Stewart, K.M.; Tapp, S.A.; Stanley, S.A.; Stanley, R.D. (1991) Captan: Chronic Toxicity to *Daphnia Magna*. Laboratory Identification: T505/F (FT11/91) Study prepared by Imperial Chemical Industries PLC. 26 p.

Freshwater Non-vascular Plants

00137688 Dickhaus, S.; Heisler, E. (1983) Algal Growth Inhibition Test with Captan: E.H./P. 1-8-150-83. (Unpublished study received Feb 22, 1984 under 11678-1; prepared by Pharmatox Forschung und Beratung GmbH, W. Ger., submitted by Makhteshim Beer Sheva Chemical Works Ltd., New York, NY; CDL:252586-A).

43869809 Smyth, D.; Sankey, S.; Tapp, J.; et al. (1990) Captan: Toxicity to the Green Alga *Selenastrum capricornutum*: Lab Project Number: BL3954/B: T505/C: FT78/90. Unpublished study prepared by Imperial Chemical Industries PLC. 22 p.

43869810 Kent, S.; Sankey, S.; Morgan, D.; et al. (1994) THPI: Toxicity to the Green Alga *Selenastrum capricornutum*: Lab Project Number: BL5238/B: AA0427/C. Unpublished study prepared by Zeneca Ltd., Brixham Environmental Lab. 22 p.

44806501 Drottar, K.R., and Krueger, H.O. (1999d). Unpublished Report: "Captan: A 96-Hour Toxicity Test with the Freshwater Alga (*Anabaena flos-aquae*)." Wildlife International Ltd., Easton, MD, 493A-101A, Captan Stewardship Task Force. April 14, 1999.

44806503 Drottar, K.R., and Krueger, H.O. (1999a). Unpublished Report: "Captan: A 7-Day Toxicity Test with Duckweed (*Lemna gibba* G3)." Wildlife International Ltd., Easton, MD, 493A-103, Stewardship Task Force. April 14, 1999.

Birds

GS999-001 Hudson, R.; Tucker, R.; Heagle, M. (1984) Handbook of Toxicity of Pesticides to Wildlife. U.S. D.I. Publication 153, Washington, D.C.

00022923 Hill, E.F.; Heath, R.G.; Spann, J.W.; et al. (1975) Lethal Dietary Toxicities of Environmental Pollutants to Birds: Special Scientific Report-Wildlife No. 191. (U.S. Dept. of the Interior, Fish and Wildlife Service, Patuxent Wildlife Research Center; unpublished report).

00098295 Chevron Chemical Company (1980) One Generation Reproduction Studies with Captan (SX-1086). (Compilation; unpublished study received Apr 5, 1982 under 239-1246; CDL:247147-C).

00098296 Chevron Chemical Company (1980) Captan (SX-1086)/One Generation Reproduction Studies, Including Diet Analyses. Includes method dated Jun 15, 1979. (Compilation; unpublished study received Apr 5, 1982 under 239-1246; CDL:247147-D).

Mammals

164355 Foster, T.; Morgan, R. (1984) Acute Oral Toxicology: Rats: Captan Technical: Laboratory Project Identification: T-11474. Unpublished study prepared by Chevron Chemical Co. 9 p.

00054789 Nelson, N. (1949) A Preliminary Toxicological Study of SR-406, a Fungicide. (Unpublished study received Jun 1, 1965 under unknown admin. no.; prepared by New York Univ., Bellevue Medical Center, Laboratory of Industrial Toxicology, submitted by Chevron Chemical Co., Richmond, Calif.; CDL:001148-A)

00125293 Schardein, J.; Schwartz, C.; Thorstenson, J. (1982) Three Generation Reproduction Study in Rats: 153-096. (Unpublished study received Jan 20, 1983 under 239-1246; prepared by International Research and Development Corp., submitted by Chevron Chemical Co., Richmond, CA; CDL:249334-A)

Terrestrial Invertebrates

00113613 Atkins, E.; Greywood, E.; Macdonald, R. (1972) Effect of Pesticides on Apiculture: Project No. 1499. Annual rept., 1972. (Unpublished study received Mar 28, 1975 under 5F1608; prepared by Univ. of California--Riverside, Dept. of Entomology, Div. of Economic Entomology, submitted by ICI United States, Inc., Wilmington, DE; CDL:094397-P)

05001991 Stevenson, J.H. (1978) The acute toxicity of unformulated pesticides to worker honey bees (*Apis mellifera*). *Plant Pathology* 27(1):38-40.

Ecotox 87252 Ladurner, E., Bosch, J., Kemp, W. P., and Maini, S. (2005). Assessing Delayed and Acute Toxicity of Five Formulated Fungicides to *Osmia lignaria* Say and *Apis mellifera*. *Apidologie* 36: 449-460.

Terrestrial Plants

Ecotox 91004 Mc Laren, N. W. and Rijkenberg, F. H. J. (1989). Efficacy of Fungicide Seed Dressings in the Control of Pre- and Post-Emergence Damping-Off and Seedling Blight of Sorghum. *S.Afr.J.Plant Soil* 6 : 167-170.

Ecotox 91168 Mantecon, J. D. (1989). Persistence of Systemic and Non-Systemic

Fungicides in the Control of Seedling Blight of Wheat (*Fusarium graminearum*). *Tests Agrochem.Cultiv.* 10: 76-77.

Ecotox 91007 Fahim, M. M., Osman, A. R., Sahab, A. F., and El-Kader, M. M. A. (1983). Agricultural Practices and Fungicide Treatments for the Control of Fusarium Wilt of Lupine. *Egypt.J.Phytopathol.* 15: 35-46.

Ecotox 90836 Davis, M. A. and Bockus, W. W. (2001). Evidence for a *Pythium* sp. as a Chronic Yield Reducer in a Continuous Grain Sorghum Field. *Plant Dis.* 85: 780-784.

Ecotox 63909 Polavarapu, S. (2000). Evaluation of Phytotoxicity of Diazinon and Captan Formulations on Highbush Blueberries. *Horttechnology* 10: 308-314.